

DESCRIPTION

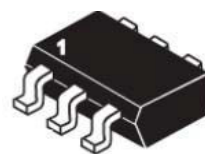
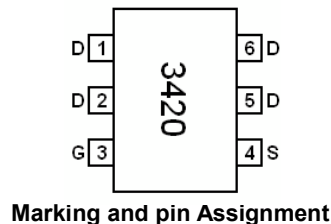
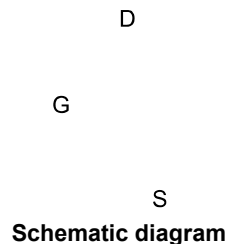
The TDM3420 uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for use as a load switch or in PWM applications.

GENERAL FEATURES

- $V_{DS} = 30V, I_D = 6.3A$
 $R_{DS(ON)} < 33m\Omega @ V_{GS}=4.5V$
 $R_{DS(ON)} < 25m\Omega @ V_{GS}=10V$
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

Application

- PWM applications
- Load switch
- Power management



SOT23-6 top view

泰德半导体—提供样品，技术支持 13418601901 QQ409545144

PACKAGE MARKING AND ORDERING INFORMATION

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
3420	TDM3420	SOT23-6	Ø180mm	8mm	3000 units

ABSOLUTE MAXIMUM RATINGS(TA=25℃ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous@ Current-Pulsed (Note 1)	$I_D (25^\circ C)$	6.3	A
	$I_D (70^\circ C)$	4.8	
	I_{DM}	20	A
Maximum Power Dissipation	P_D	1.6	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	℃

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	78	℃/W
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ELECTRICAL CHARACTERISTICS (TA=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30			V

N-Channel Enhancement Mode MOSFET

TDM3420

Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=24V, V_{GS}=0V$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
ON CHARACTERISTICS (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.9	3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=5.5A$		26	33	m Ω
		$V_{GS}=10V, I_D=6.3A$		20	25	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=6.3A$		10		S
DYNAMIC CHARACTERISTICS (Note4)						
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V,$ $F=1.0MHz$		600		PF
Output Capacitance	C_{oss}			150		PF
Reverse Transfer Capacitance	C_{rss}			70		PF
SWITCHING CHARACTERISTICS (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=15V, V_{GS}=10V, R_{GEN}=6\Omega$ $I_D=1A$		8		nS
Turn-on Rise Time	t_r			4		nS
Turn-Off Delay Time	$t_{d(off)}$			22		nS
Turn-Off Fall Time	t_f			4		nS
Total Gate Charge	Q_g	$V_{DS}=15V, I_D=6.3A, V_{GS}=10V$		10		nC
Gate-Source Charge	Q_{gs}			2		nC
Gate-Drain Charge	Q_{gd}			2		nC
Body Diode Reverse Recovery Time	T_{rr}	$I_F=6.3A, di/dt=100A/\mu s$		18		nS
Body Diode Reverse Recovery Charge	Q_{rr}			9		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=1.3A$		0.8	1.2	V

NOTES:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on 1in² FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production testing.



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

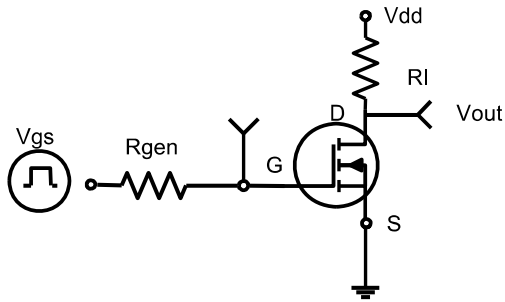


Figure 1: Switching Test Circuit

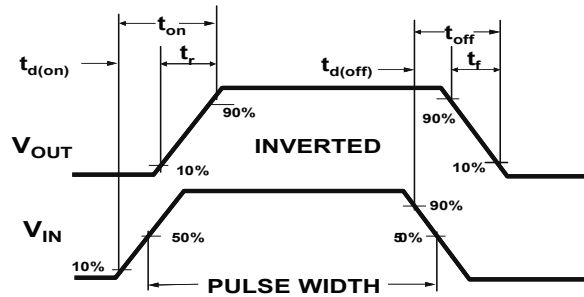


Figure 2: Switching Waveforms

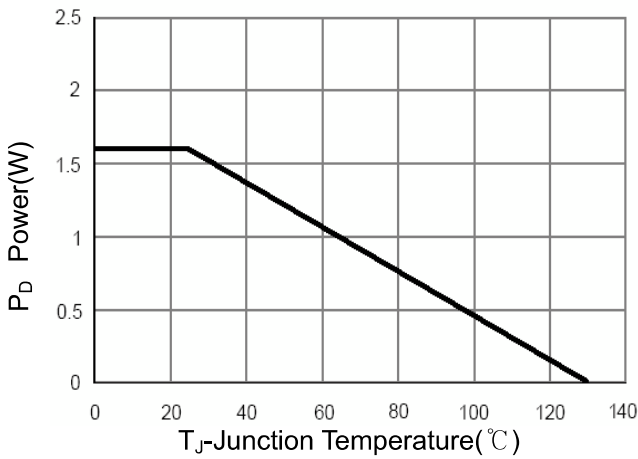


Figure 3 Power Dissipation

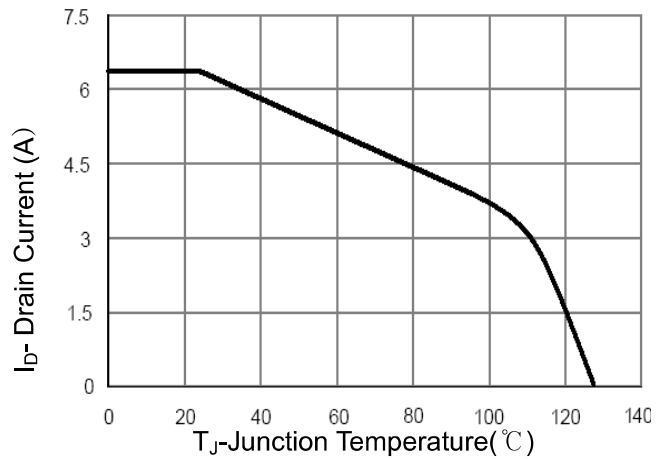


Figure 4 Drain Current

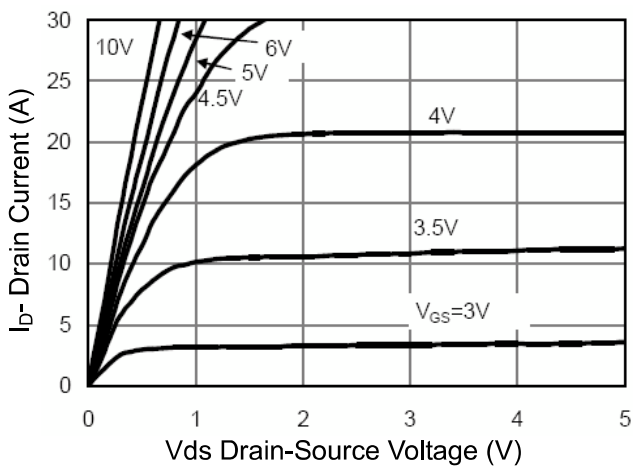


Figure 5 Output CHARACTERISTICS

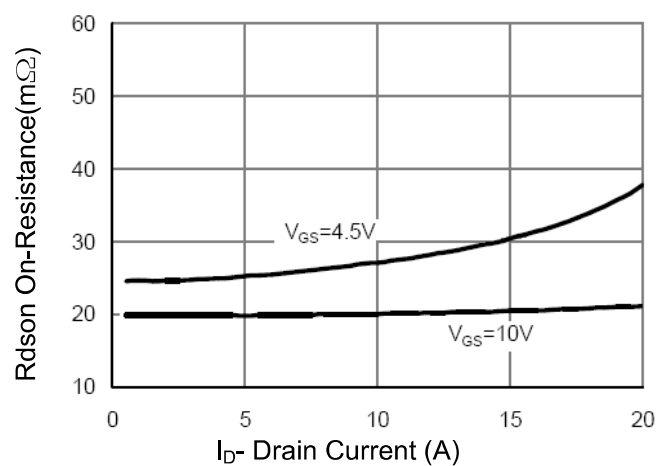


Figure 6 Drain-Source On-Resistance

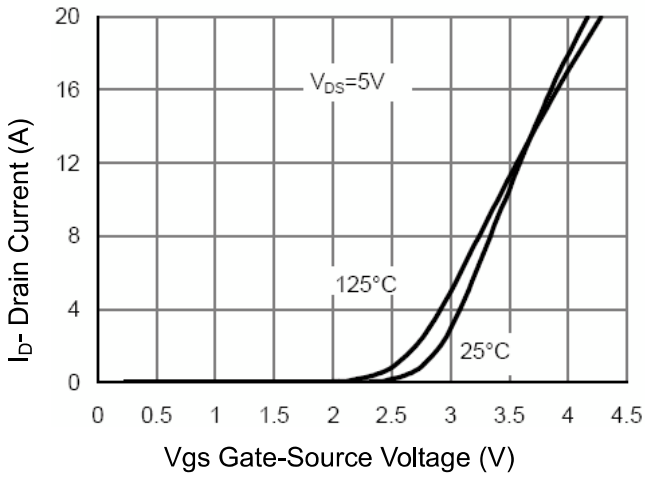


Figure 7 Transfer Characteristics

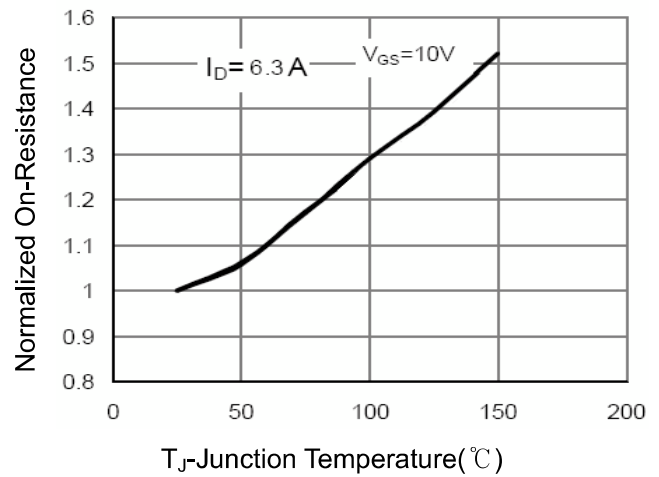


Figure 8 Drain-Source On-Resistance

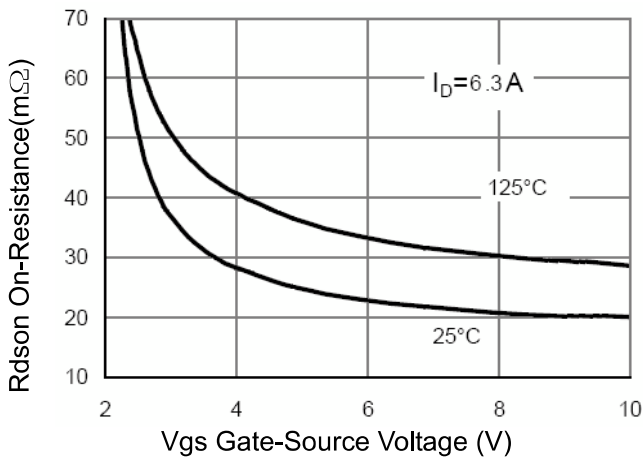


Figure 9 Rdson vs Vgs

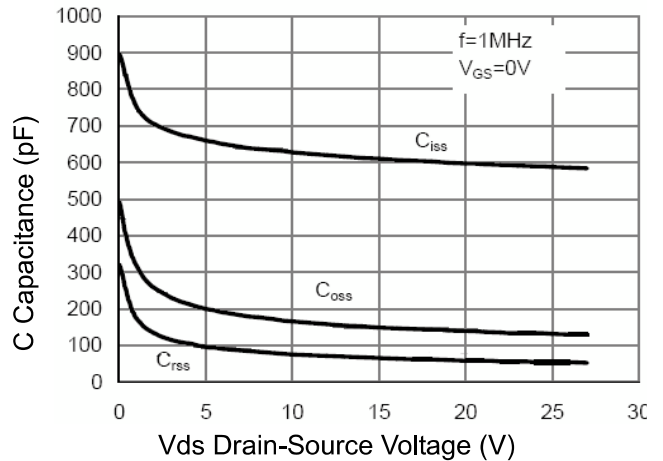


Figure 10 Capacitance vs Vds

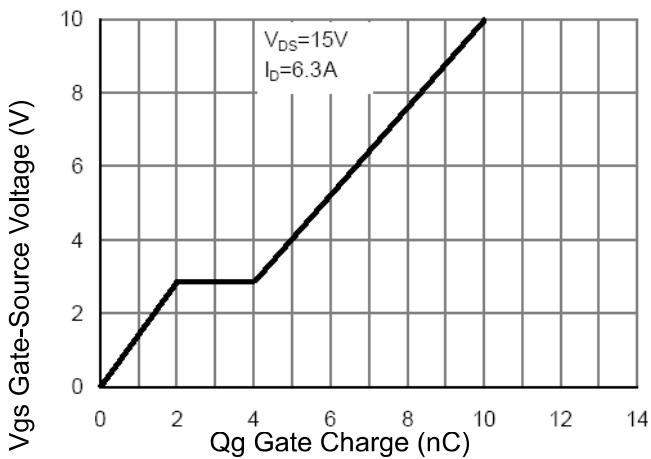


Figure 11 Gate Charge

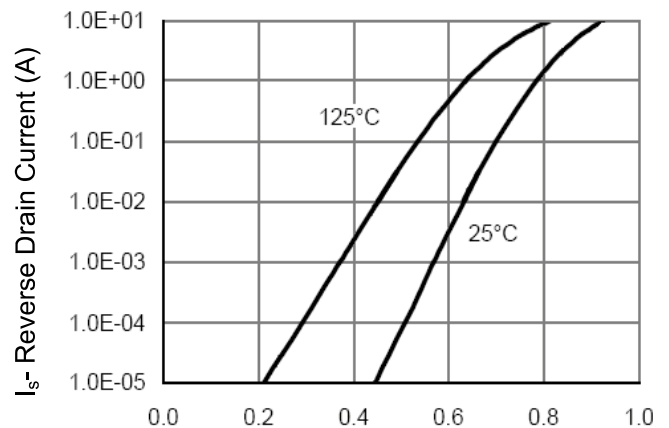


Figure 12 Source- Drain Diode Forward

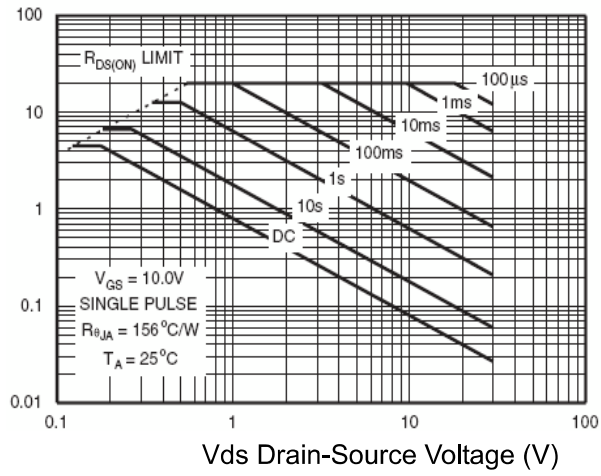
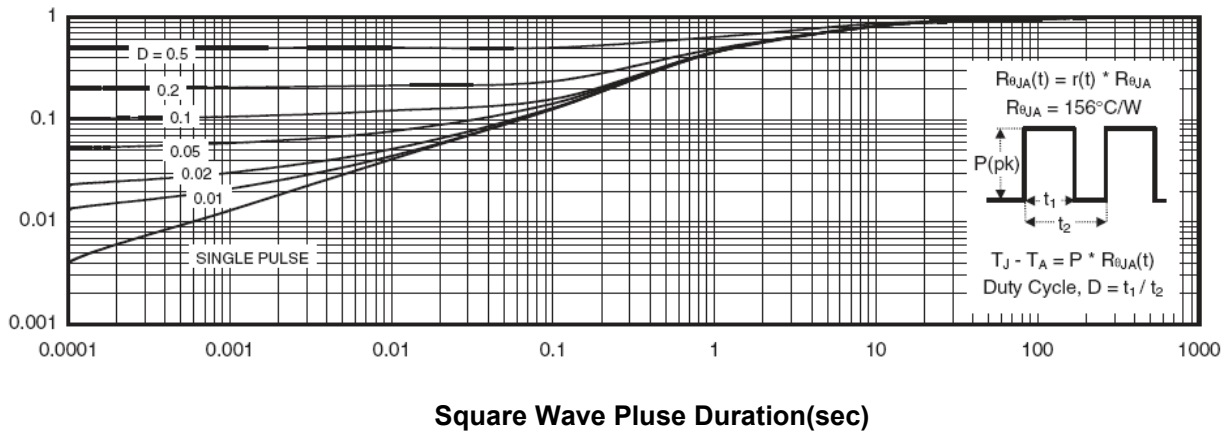


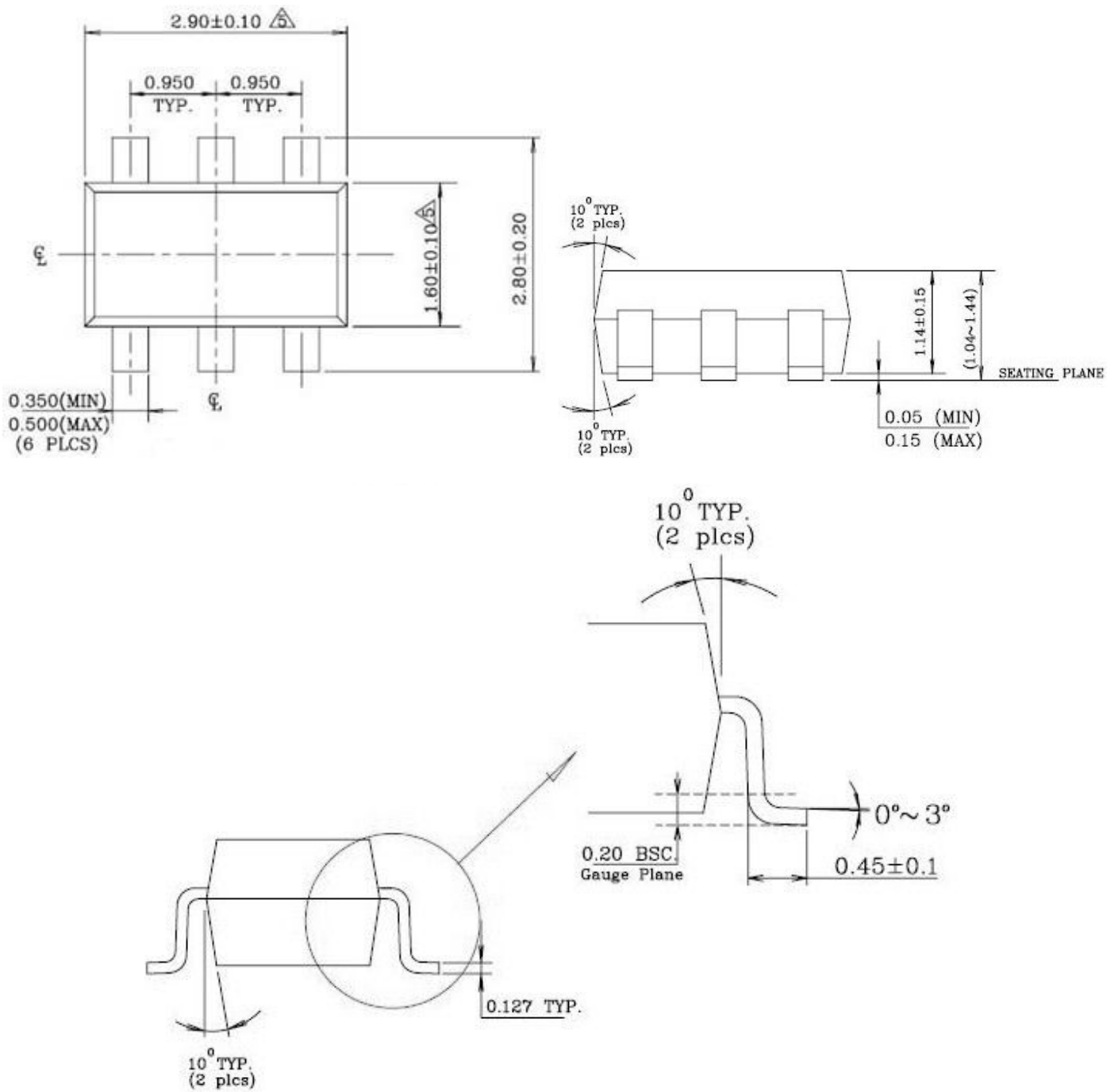
Figure 13 Safe Operation Area



Square Wave Pulse Duration(sec)

Package Information

SOT23-6 Package Outline Dimensions



Design Notes